



Neurotrauma Nursing: Neurological Assessment

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Objectives

- List five components that make up the neuro exam of the critically ill patient
- Name the most sensitive component of the neuro assessment
- Describe the difference between decorticate & decerebrate posturing
- Describe pupillary assessment and what to report to MD
- Describe the difference in the neuro assessment of the conscious –vs- unconscious patient



Neuro Assessment

- Purpose
 - Evaluate the function of the nervous system
 - Detect nervous system dysfunction
 - Monitor response to treatment
 - Evaluate patient outcomes
 - Identify teaching needs
 - Determine highest level of functional ability
- Components
 - History
 - Physical Exam



- **Precipitating Events**
- **Family History**
- **Medical Surgical History**



Physical Exam

- **Components**
 - Vital Signs
 - Consciousness
 - Glasgow Coma Scale
 - Motor Function
 - Sensory Function
 - Cranial Nerve Function
 - Reflexes



Glasgow Coma Scale

- Quick and easy way to describe baseline LOC
- Tests
 - Eye Opening
 - Verbal
 - Motor Response
- Highest score possible: 15
- Lowest score possible 3



Level of Consciousness

- LOC is the **MOST** important part of a Neuro exam!!
- A change in LOC is the earliest & MOST sensitive indication of a change in the patients' neuro status!
- Sedation should be stopped or decreased for an accurate assessment



Level of Consciousness

- **Arousal:** lowest level. Focuses on the patient's ability to respond to verbal or noxious stimuli in an appropriate manner.

Vs.

- **Awareness:** higher-level function. Assesses orientation to person, place, time, & events



Level of Consciousness

- **Full Consciousness:** Alert, awake, responds appropriately to stimuli, follows commands.
- **Confusion:** Disoriented, short attention span, agitated, restless, may have hallucinations.
- **Lethargic:** Drowsy, delayed response to stimuli, slow in speech and mental process, & may drift off to sleep during exam.



Level of Consciousness

- **Obtunded:** Able to arouse with stimulation very drowsy. Response is minimally maintained. Indifference to external stimuli exists.
- **Stuporous:** Minimal spontaneous movement. Verbal responses are minimal & incomprehensible. Requires vigorous stimuli to elicit a response.
- **Comatose:** Awareness & arousal are absent. No response to verbal or painful stimuli.



Motor Exam

- **Strength Scale**

- 0 = Flaccid
- 1 = Muscle Contraction
- 2 = Lateral movement only
- 3 = Raise against gravity but unable to sustain
- 4 = Can raise and sustain against gravity
- 5 = Normal

- ** Key element:*

- ** Compare strength between right and left side of body*



Motor Exam

- Noxious Stimuli = PAIN
- Two categories
 - Central: the brain responds
 - Peripheral: the spine responds

**Note: Use the least amount of stimulus to elicit a response*



Cerebellar Exam

- **Upper Extremity Coordination**
 - Finger to Nose Testing
 - Rapid Alternating Finger Movements
 - Rapid Alternating Hand Movements
 - Place palm and then dorsal side of the hand on thigh rapidly
- **Lower Extremity Coordination**
 - Heel to Shin
 - Gait



Central Pain Stimulus

- **Trapezius Squeeze:** angle where neck & shoulder meet. Using thumb & two fingers take hold and squeeze.
- **Sternal Rub:** usually done with the knuckles in a grinding motion. (if done repeatedly, this will bruise the patients chest)



Peripheral Pain Stimulus

- **Nail bed pressure:** Using a pen or pencil laid across the base of the cuticle, apply firm pressure.

**Note: Elicited response may be a reflex response and may not be a true indicator of level of consciousness.*



Posturing

- **Decorticate:**
flexion posturing
- **Decerebrate:**
rigid extension



Sensory Exam

Dermatomes



Cranial Nerves



Pupillary Response

- **Extremely small pupils**
 - Possible narcotic/sedative overdose
 - Therapeutic levels of narcotics/sedatives
 - Lower brain stem compression
 - Bilateral damage to the Pons
- **Large pupils**
 - Instillation or use of Atropine, scopolamine
 - Indication of extreme stress



Pupillary Changes

- Change or inequality in pupil size, reaction, especially in patients who have NOT shown this discrepancy before, **IS A SIGNIFICANT** neurological sign!
- Unilateral pupil dilation may indicate herniation and should be reported **IMMEDIATELY**



Rapid Neuro Exam

• Conscious Patient

- LOC
- CN assessment
- Motor assessment
- Sensory assessment
- Respiratory pattern
- VS
- Change in status

• Unconscious Patient

- LOC
- CN assessment
- Motor assessment
- Respiratory pattern
- VS
- Change in status



Analyzing the Data

- What do I see?
- What does it mean?
- How does it relate to the previous assessment?
- How am I going to proceed?



When to notify the Physician

- If neurological status deteriorates with or without changes in hemodynamic status
- If CSF drainage develops
- New onset of seizures



Emergency!!!

- **Notify MD Immediately**
 - Unilateral pupil dilation
 - New onset of posturing
 - Loss of Cutaneous Reflexes (cough and gag)



Conclusion

- The neuro exam should be organized, thorough, & simple.
- Findings should **ALWAYS** be evaluated in comparison to previous exams
- **ANY** neurological deficit identified that is **NEW** or **DIFFERENT** from that of the last assessment, should be focused on in detail & reported.